FIG. 1

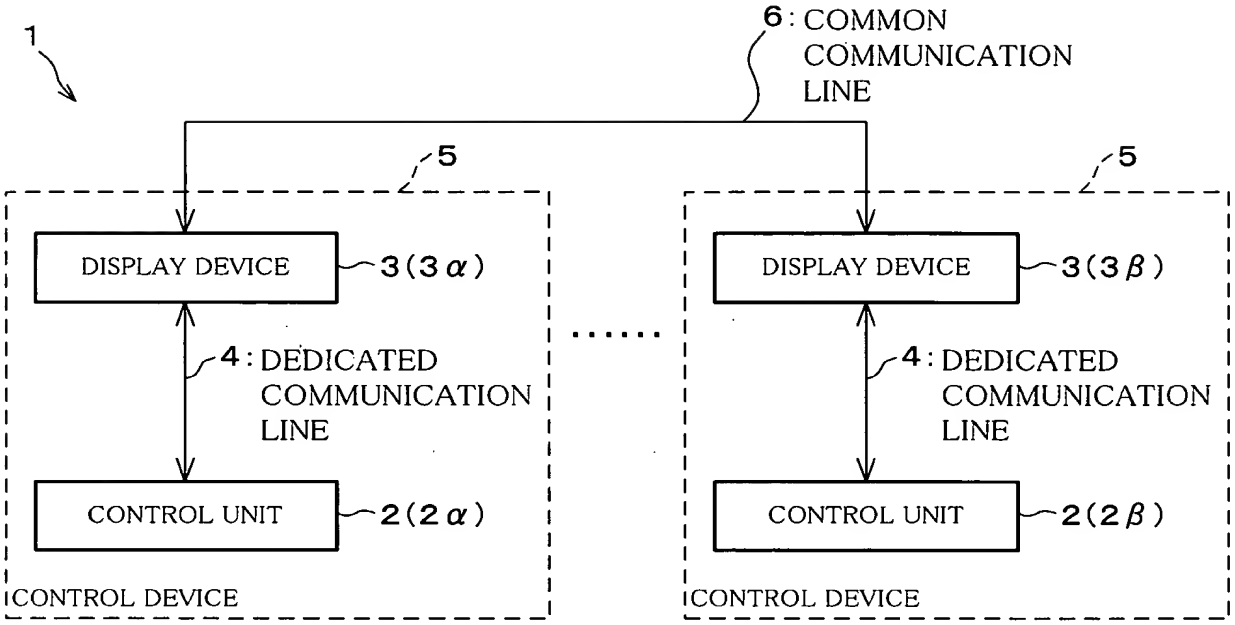

FIG. 2

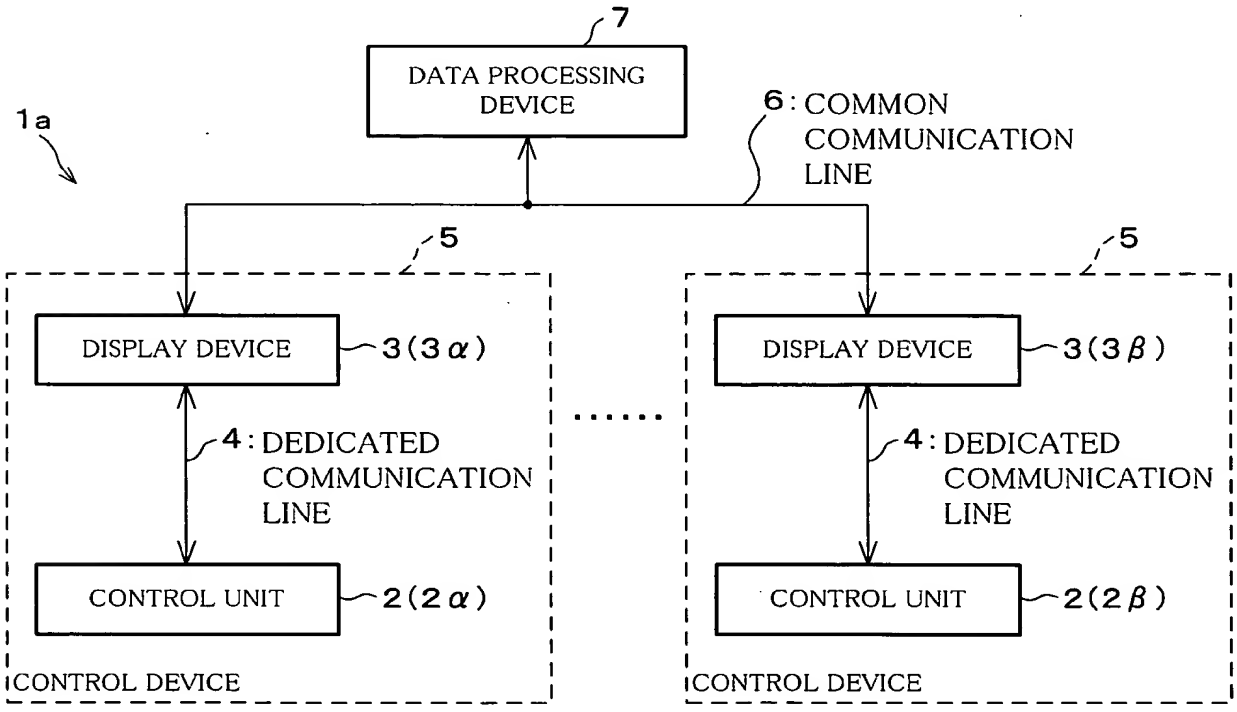

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FIG. 3

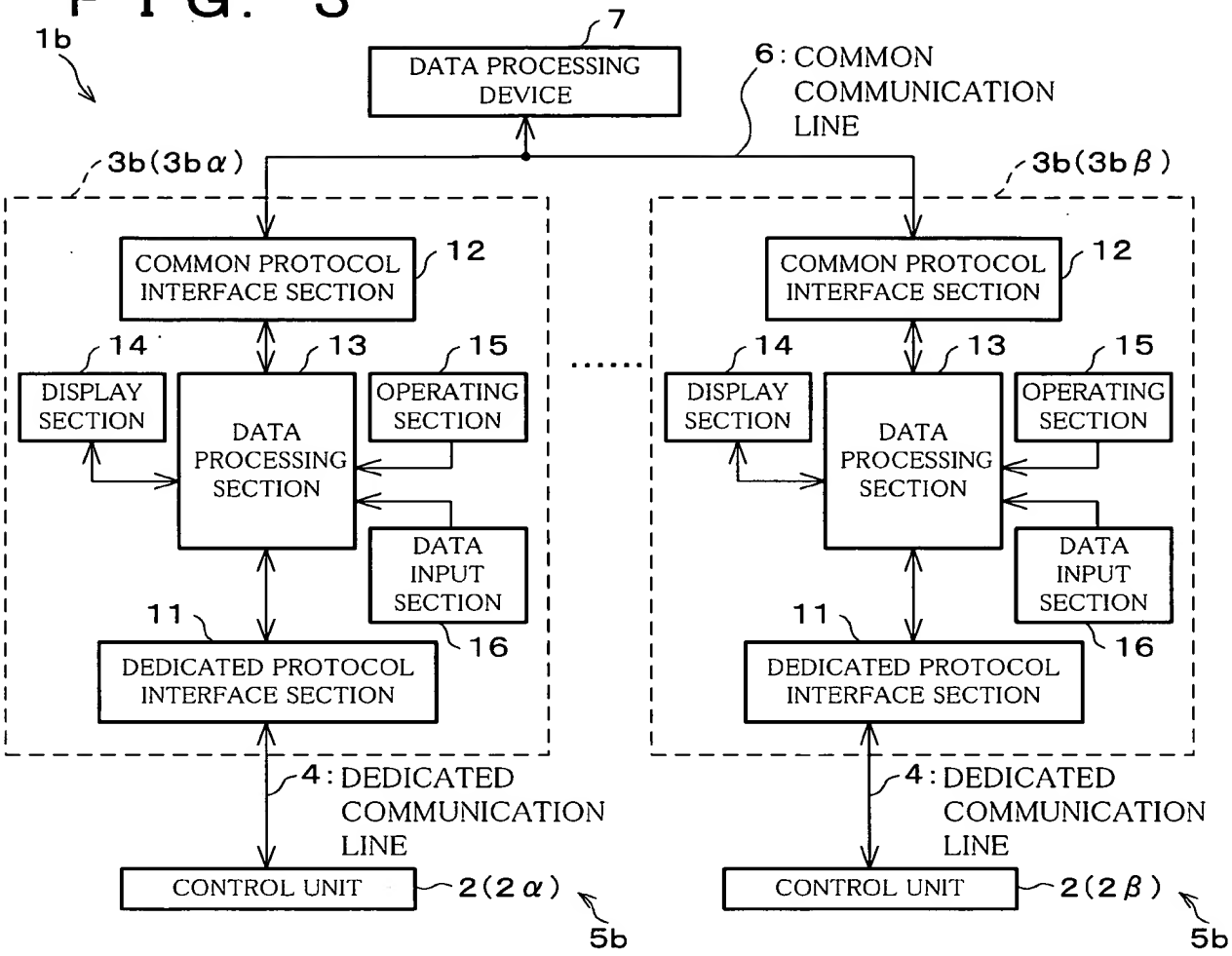
1b
7
DATA PROCESSING DEVICE
6: COMMON COMMUNICATION LINE
3b(3bα)
3b(3bβ)
COMMON PROTOCOL INTERFACE SECTION
12
14
13
15
DISPLAY SECTION
DATA PROCESSING SECTION
OPERATING SECTION
DATA INPUT SECTION
16
11
DEDICATED PROTOCOL INTERFACE SECTION
4: DEDICATED COMMUNICATION LINE
CONTROL UNIT
2(2α)
2(2β)
5b

FIG. 4

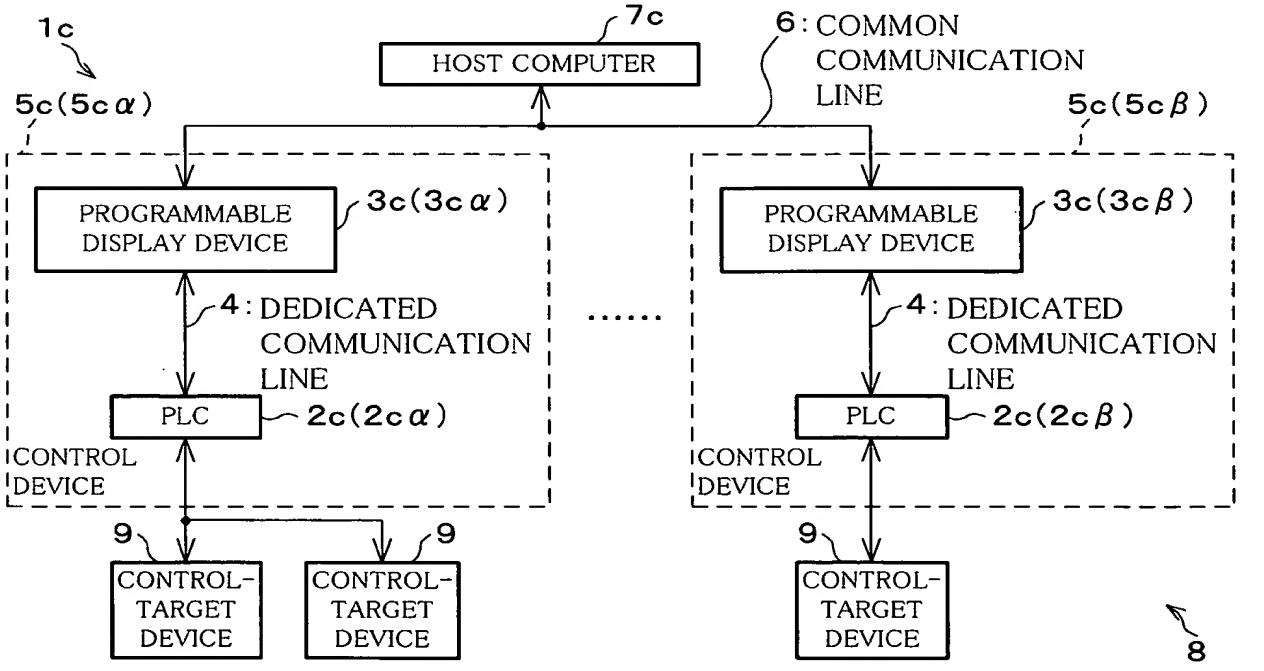
1c
7c
HOST COMPUTER
6: COMMON COMMUNICATION LINE
5c(5cα)
5c(5cβ)
PROGRAMMABLE DISPLAY DEVICE
3c(3cα)
3c(3cβ)
4: DEDICATED COMMUNICATION LINE
PLC
2c(2cα)
2c(2cβ)
CONTROL DEVICE
9
CONTROL-TARGET DEVICE
8

FIG. 5

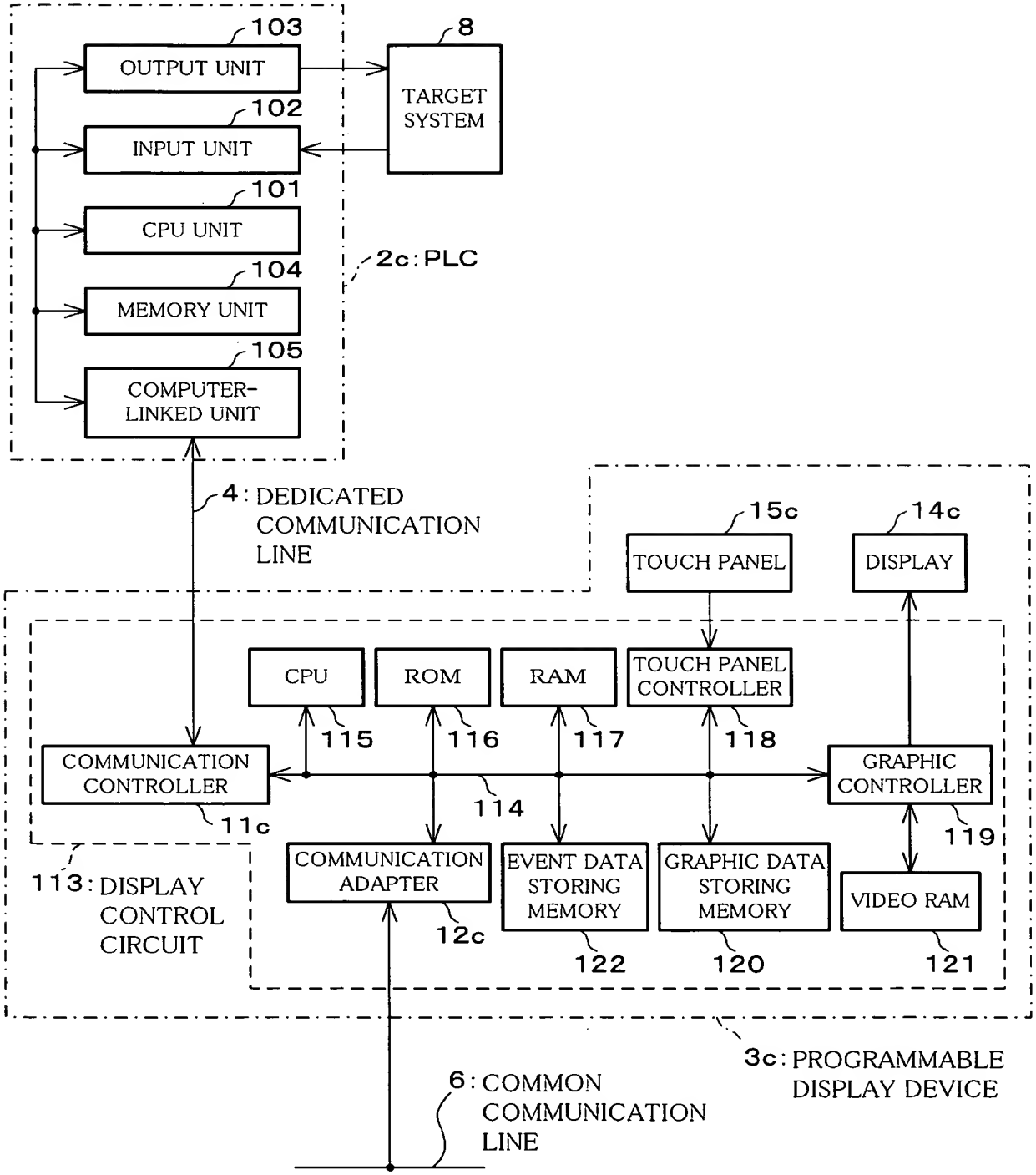
103
OUTPUT UNIT
8
TARGET SYSTEM
102
INPUT UNIT
101
CPU UNIT
2c: PLC
104
MEMORY UNIT
105
COMPUTER-LINKED UNIT
4: DEDICATED COMMUNICATION LINE
15c
TOUCH PANEL
14c
DISPLAY
CPU
ROM
RAM
TOUCH PANEL CONTROLLER
115
116
117
118
COMMUNICATION CONTROLLER
GRAPHIC CONTROLLER
114
11c
119
113: DISPLAY CONTROL CIRCUIT
COMMUNICATION ADAPTER
EVENT DATA STORING MEMORY
GRAPHIC DATA STORING MEMORY
VIDEO RAM
12c
122
120
121
3c: PROGRAMMABLE DISPLAY DEVICE
6: COMMON COMMUNICATION LINE

FIG. 6

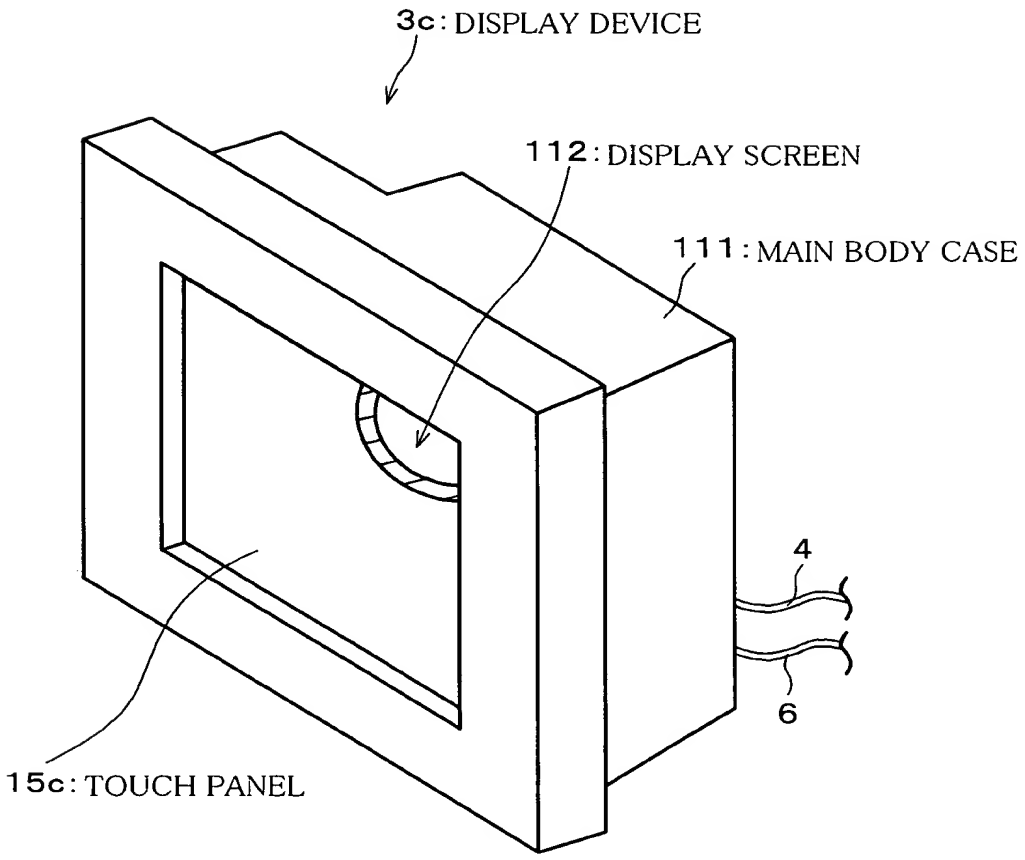

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FIG. 7 (a)

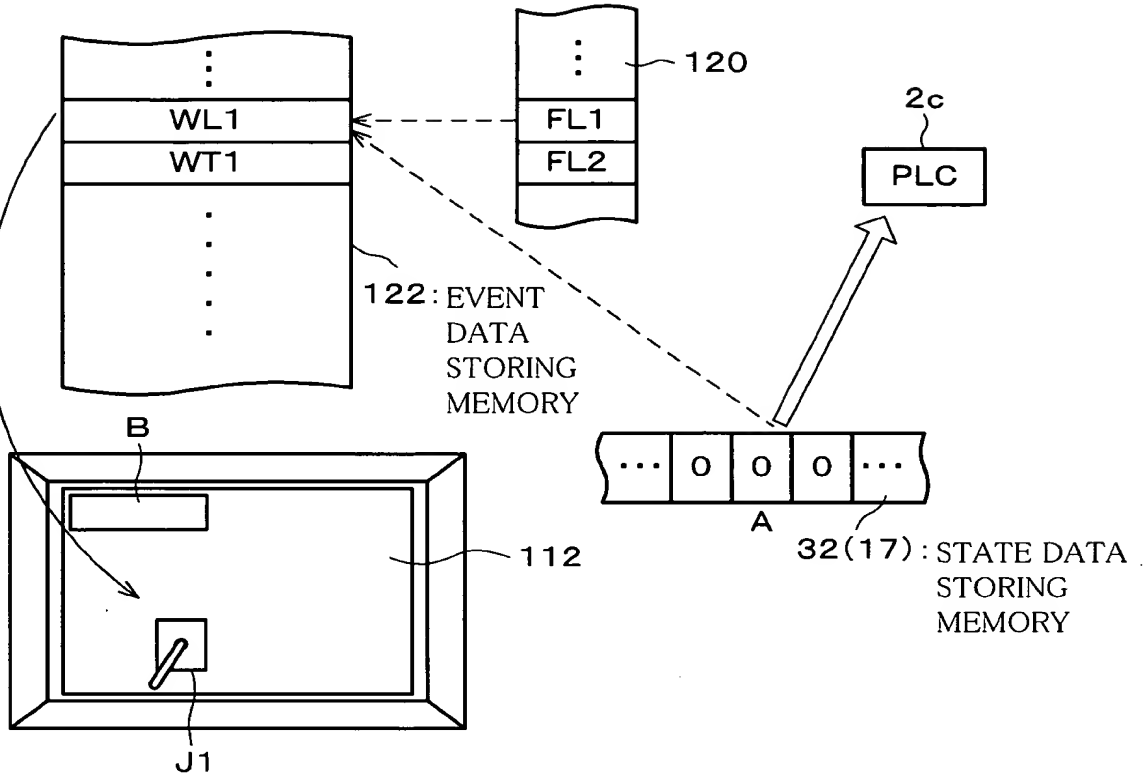

FIG. 7 (b)

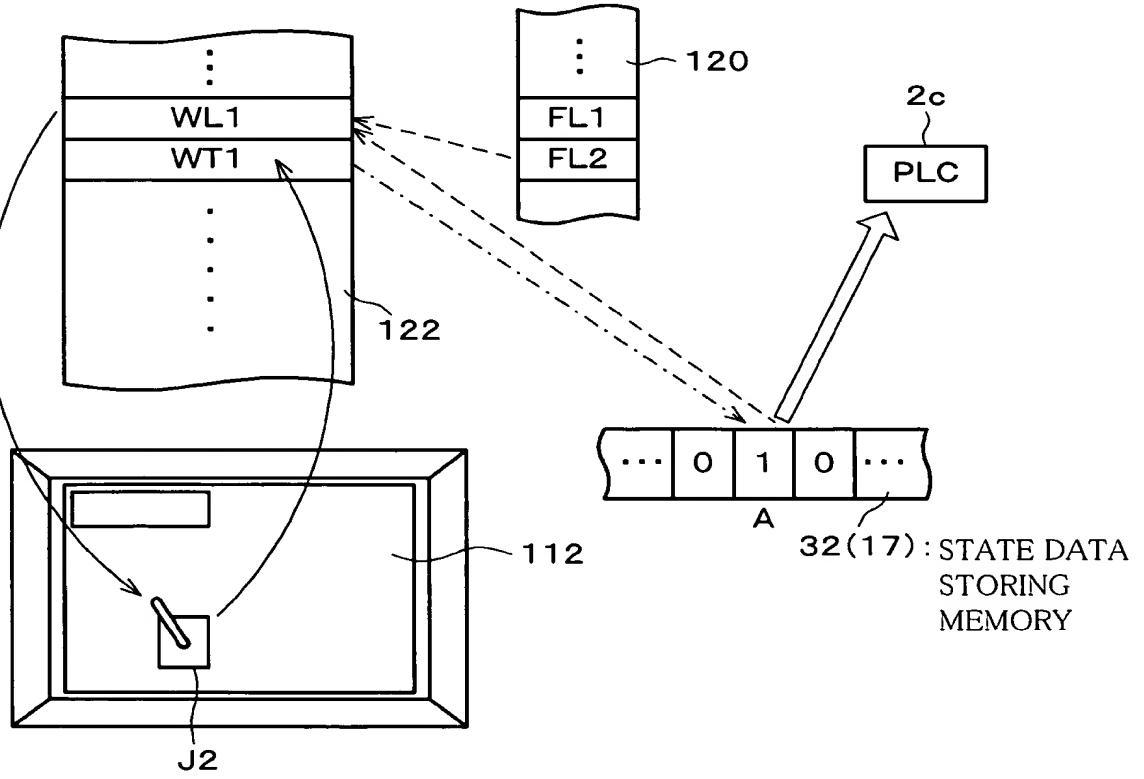

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FIG. 8 (a)

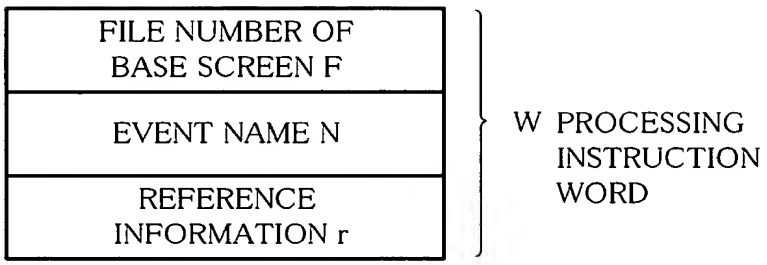

FIG. 8 (b)

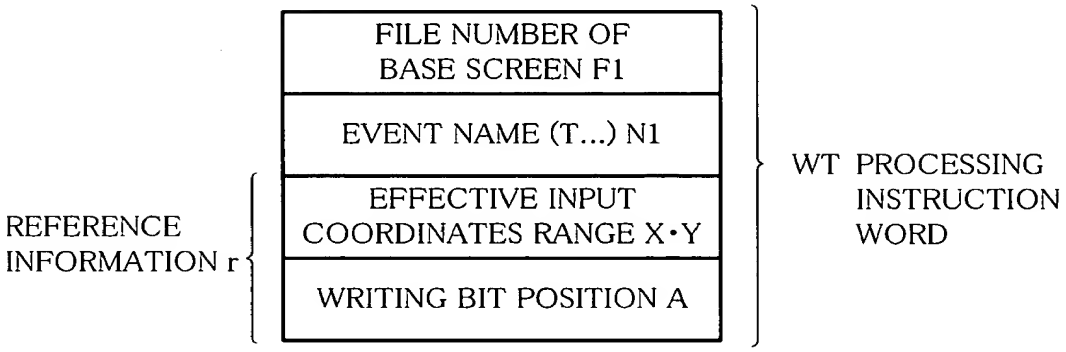

FIG. 8 (c)

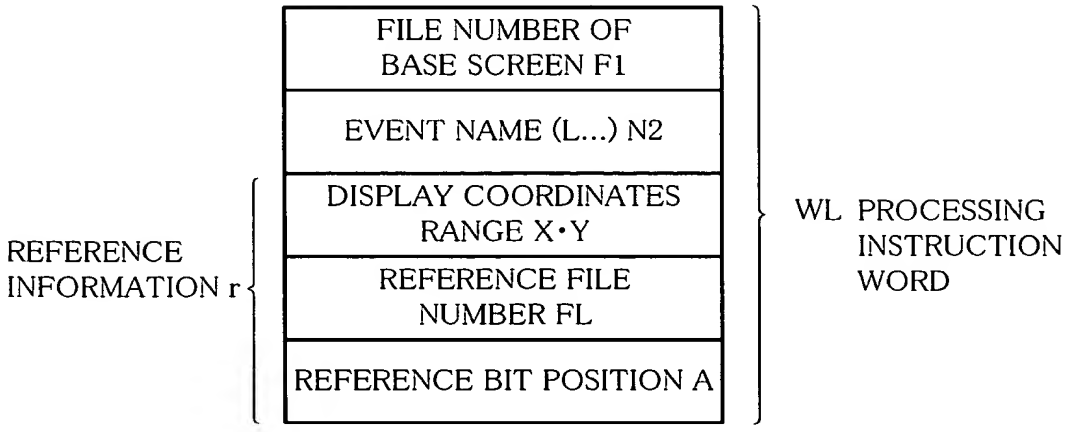

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FIG. 9

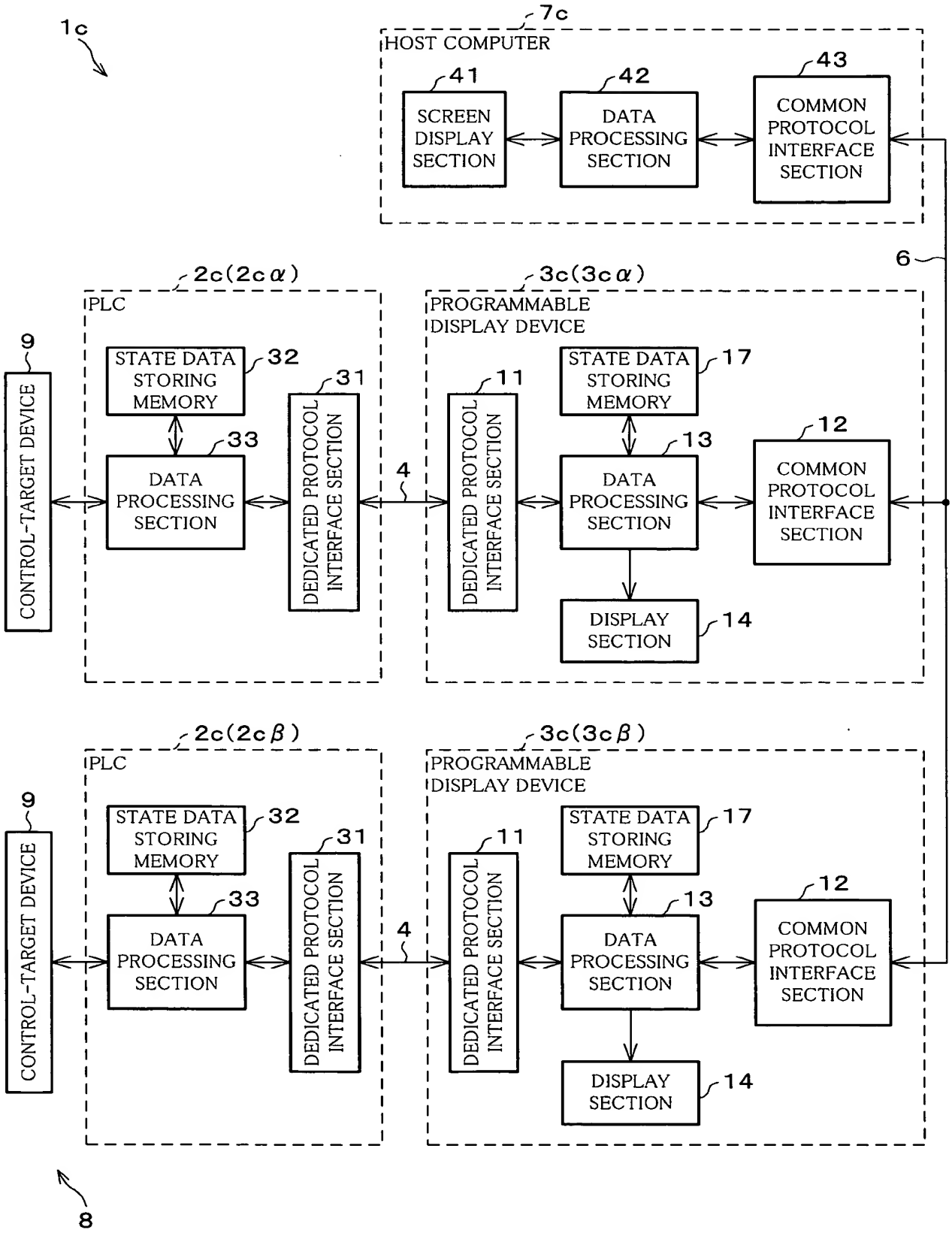
1c
7c
HOST COMPUTER
41
SCREEN DISPLAY SECTION
42
DATA PROCESSING SECTION
43
COMMON PROTOCOL INTERFACE SECTION
6
2c(2cα)
PLC
3c(3cα)
PROGRAMMABLE DISPLAY DEVICE
9
CONTROL-TARGET DEVICE
STATE DATA STORING MEMORY
32
33
DATA PROCESSING SECTION
31
DEDICATED PROTOCOL INTERFACE SECTION
4
11
DEDICATED PROTOCOL INTERFACE SECTION
STATE DATA STORING MEMORY
17
13
DATA PROCESSING SECTION
12
COMMON PROTOCOL INTERFACE SECTION
DISPLAY SECTION
14
2c(2cβ)
PLC
3c(3cβ)
PROGRAMMABLE DISPLAY DEVICE
9
CONTROL-TARGET DEVICE
STATE DATA STORING MEMORY
32
33
DATA PROCESSING SECTION
31
DEDICATED PROTOCOL INTERFACE SECTION
4
11
DEDICATED PROTOCOL INTERFACE SECTION
STATE DATA STORING MEMORY
17
13
DATA PROCESSING SECTION
12
COMMON PROTOCOL INTERFACE SECTION
DISPLAY SECTION
14
8

FIG. 10

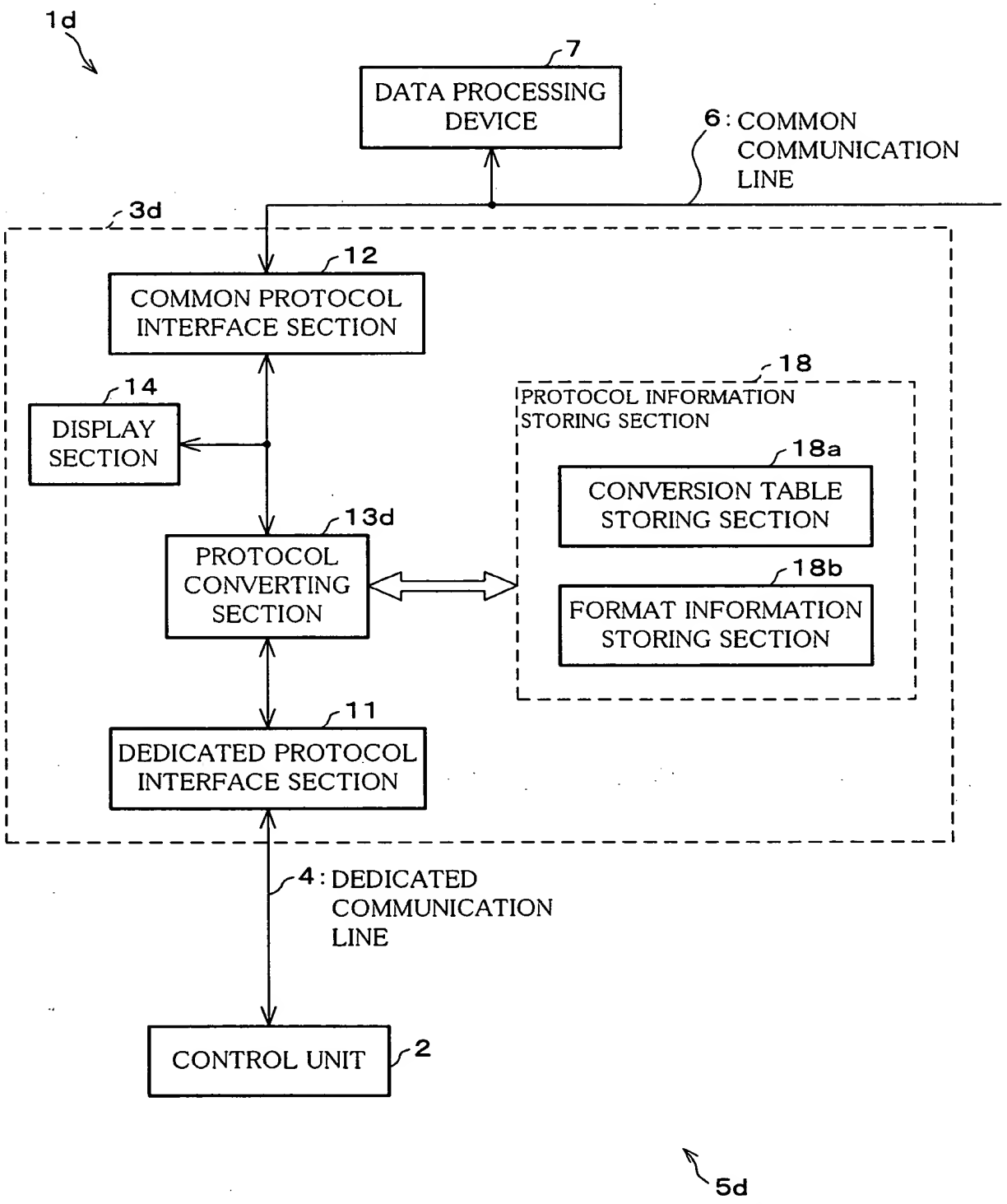
1d
7
DATA PROCESSING DEVICE
6: COMMON COMMUNICATION LINE
3d
12
COMMON PROTOCOL INTERFACE SECTION
14
DISPLAY SECTION
18
PROTOCOL INFORMATION STORING SECTION
18a
CONVERSION TABLE STORING SECTION
18b
FORMAT INFORMATION STORING SECTION
13d
PROTOCOL CONVERTING SECTION
11
DEDICATED PROTOCOL INTERFACE SECTION
4: DEDICATED COMMUNICATION LINE
CONTROL UNIT
2
5d

FIG. 11

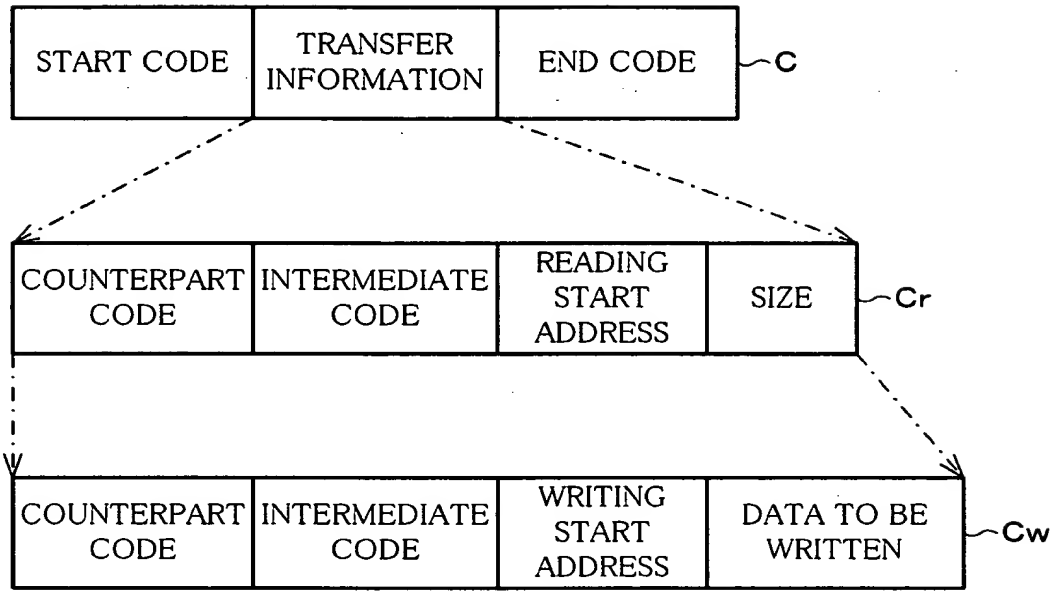

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FIG. 12

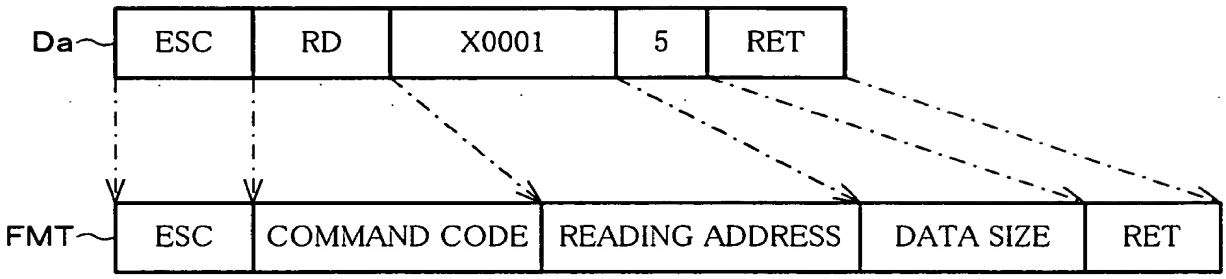

FIG. 13

TBLα

COMMON CODE	COMMAND CODE
00	A
01	A_RD
02	A_WD
⋮	⋮

⟺

TBLβ

COMMON CODE	COMMAND CODE
00	B
01	B_RD
02	B_WD
⋮	⋮

FIG. 14

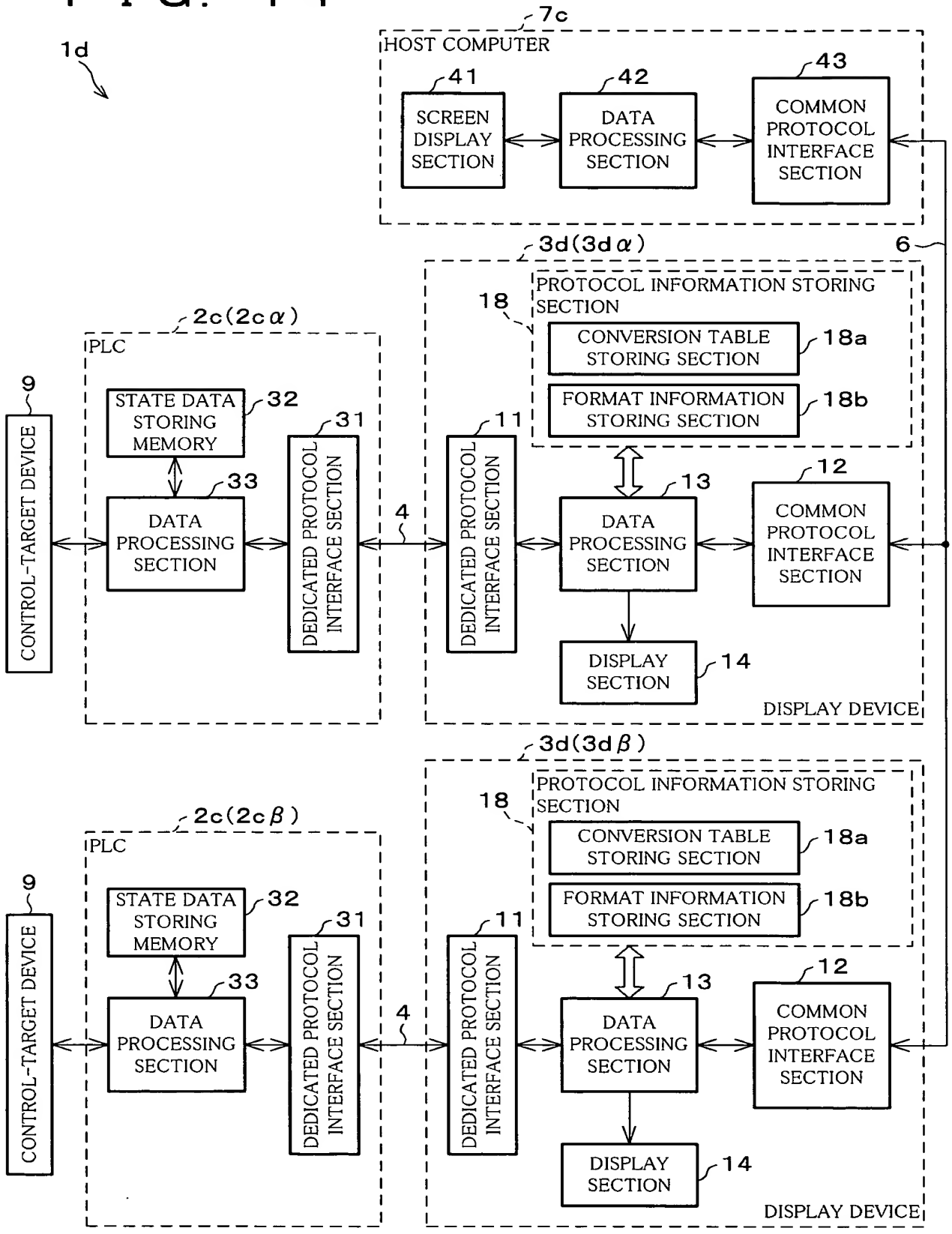
1d
7c
HOST COMPUTER
41
SCREEN DISPLAY SECTION
42
DATA PROCESSING SECTION
43
COMMON PROTOCOL INTERFACE SECTION
6
3d(3dα)
PROTOCOL INFORMATION STORING SECTION
18
CONVERSION TABLE STORING SECTION
18a
FORMAT INFORMATION STORING SECTION
18b
2c(2cα)
PLC
9
CONTROL-TARGET DEVICE
STATE DATA STORING MEMORY
32
31
DEDICATED PROTOCOL INTERFACE SECTION
33
DATA PROCESSING SECTION
4
11
DEDICATED PROTOCOL INTERFACE SECTION
13
DATA PROCESSING SECTION
12
COMMON PROTOCOL INTERFACE SECTION
DISPLAY SECTION
14
DISPLAY DEVICE
3d(3dβ)
PROTOCOL INFORMATION STORING SECTION
18
CONVERSION TABLE STORING SECTION
18a
FORMAT INFORMATION STORING SECTION
18b
2c(2cβ)
PLC
9
CONTROL-TARGET DEVICE
STATE DATA STORING MEMORY
32
31
DEDICATED PROTOCOL INTERFACE SECTION
33
DATA PROCESSING SECTION
4
11
DEDICATED PROTOCOL INTERFACE SECTION
13
DATA PROCESSING SECTION
12
COMMON PROTOCOL INTERFACE SECTION
DISPLAY SECTION
14
DISPLAY DEVICE

FIG. 15

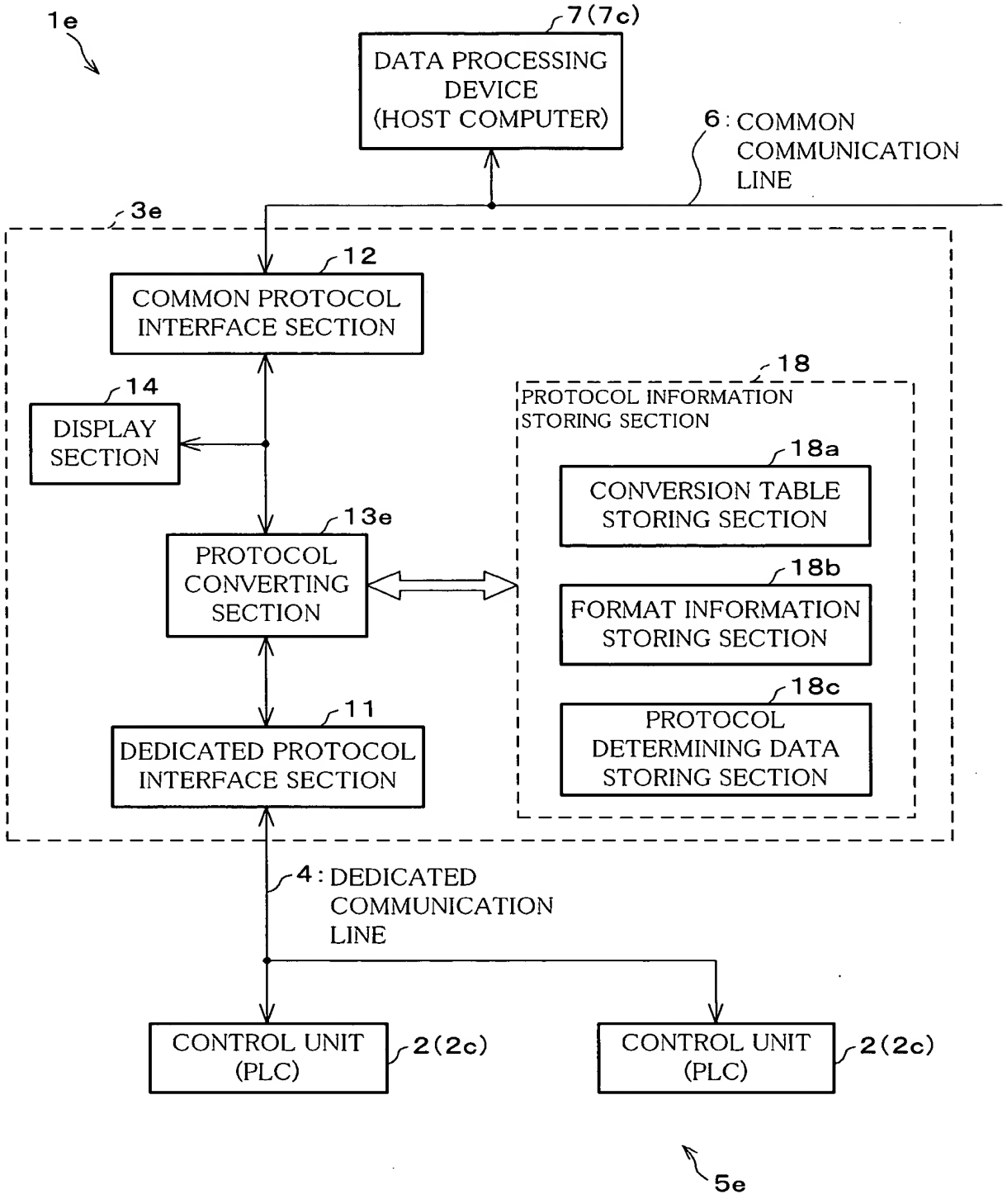
1e
7(7c)
DATA PROCESSING DEVICE (HOST COMPUTER)
6: COMMON COMMUNICATION LINE
3e
12
COMMON PROTOCOL INTERFACE SECTION
14
DISPLAY SECTION
18
PROTOCOL INFORMATION STORING SECTION
18a
CONVERSION TABLE STORING SECTION
13e
PROTOCOL CONVERTING SECTION
18b
FORMAT INFORMATION STORING SECTION
18c
PROTOCOL DETERMINING DATA STORING SECTION
11
DEDICATED PROTOCOL INTERFACE SECTION
4: DEDICATED COMMUNICATION LINE
CONTROL UNIT (PLC)
2(2c)
CONTROL UNIT (PLC)
2(2c)
5e

FIG. 16 (a)

PROTOCOL	RESPONSE CODE
α	10
α2	10
β	20
γ	30

FIG. 16 (b)

PROTOCOL	RESPONSE CODE
α	01
α2	02
β	01
γ	01

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FIG. 17

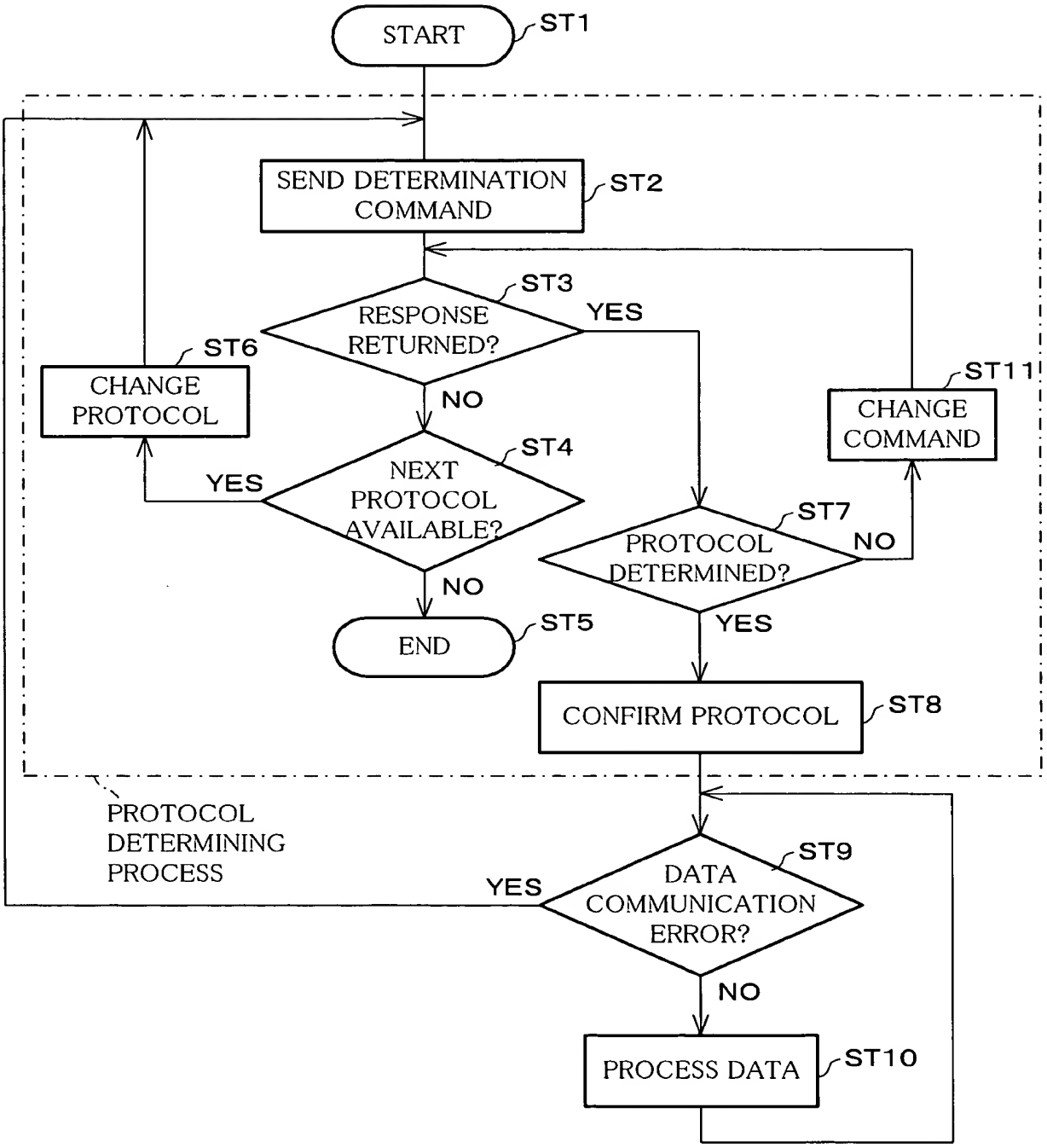
START
ST1
SEND DETERMINATION COMMAND
ST2
RESPONSE RETURNED?
ST3
YES
NO
CHANGE PROTOCOL
ST6
NEXT PROTOCOL AVAILABLE?
ST4
YES
NO
END
ST5
PROTOCOL DETERMINED?
ST7
NO
YES
CHANGE COMMAND
ST11
CONFIRM PROTOCOL
ST8
PROTOCOL DETERMINING PROCESS
DATA COMMUNICATION ERROR?
ST9
YES
NO
PROCESS DATA
ST10

FIG. 18

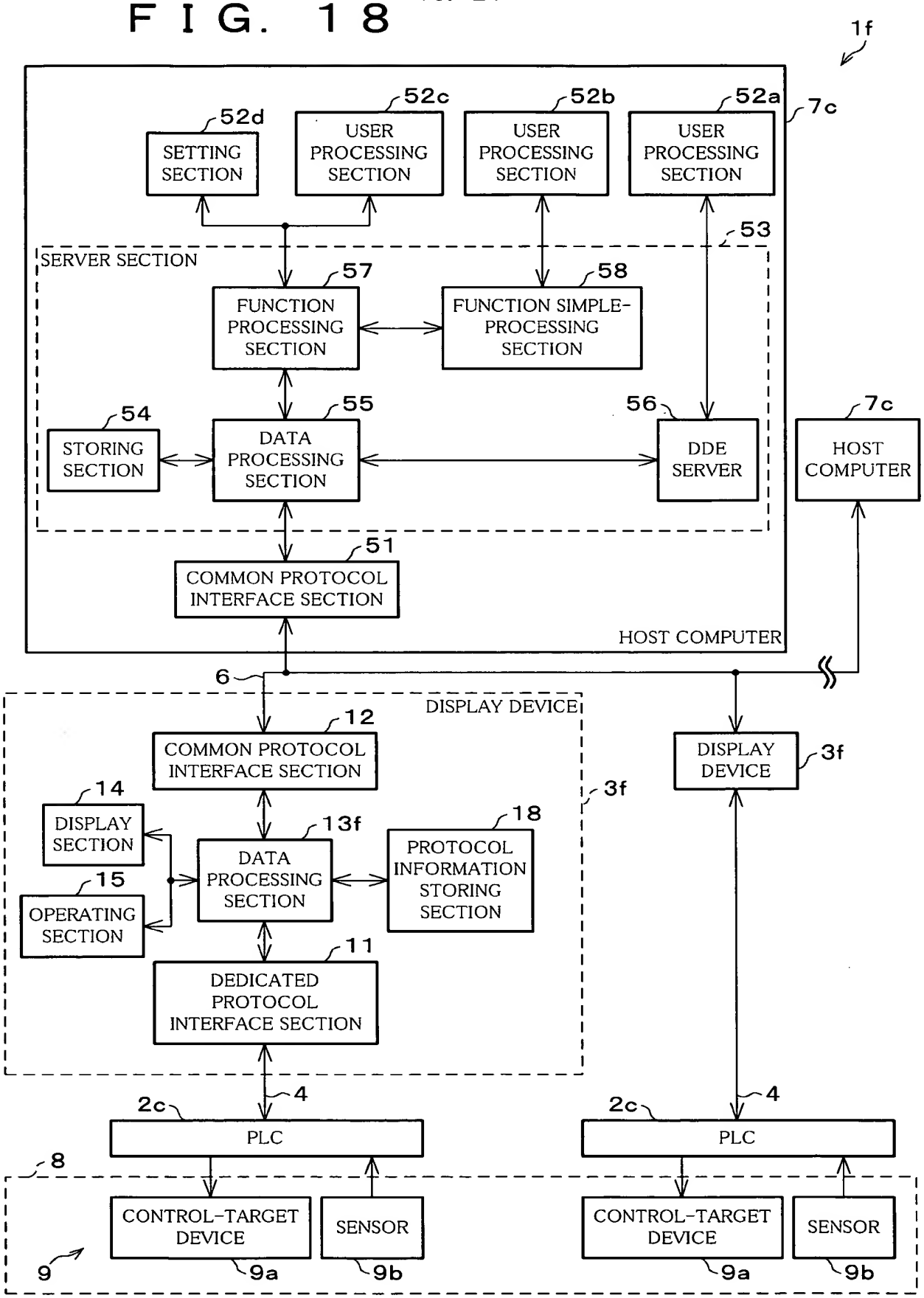

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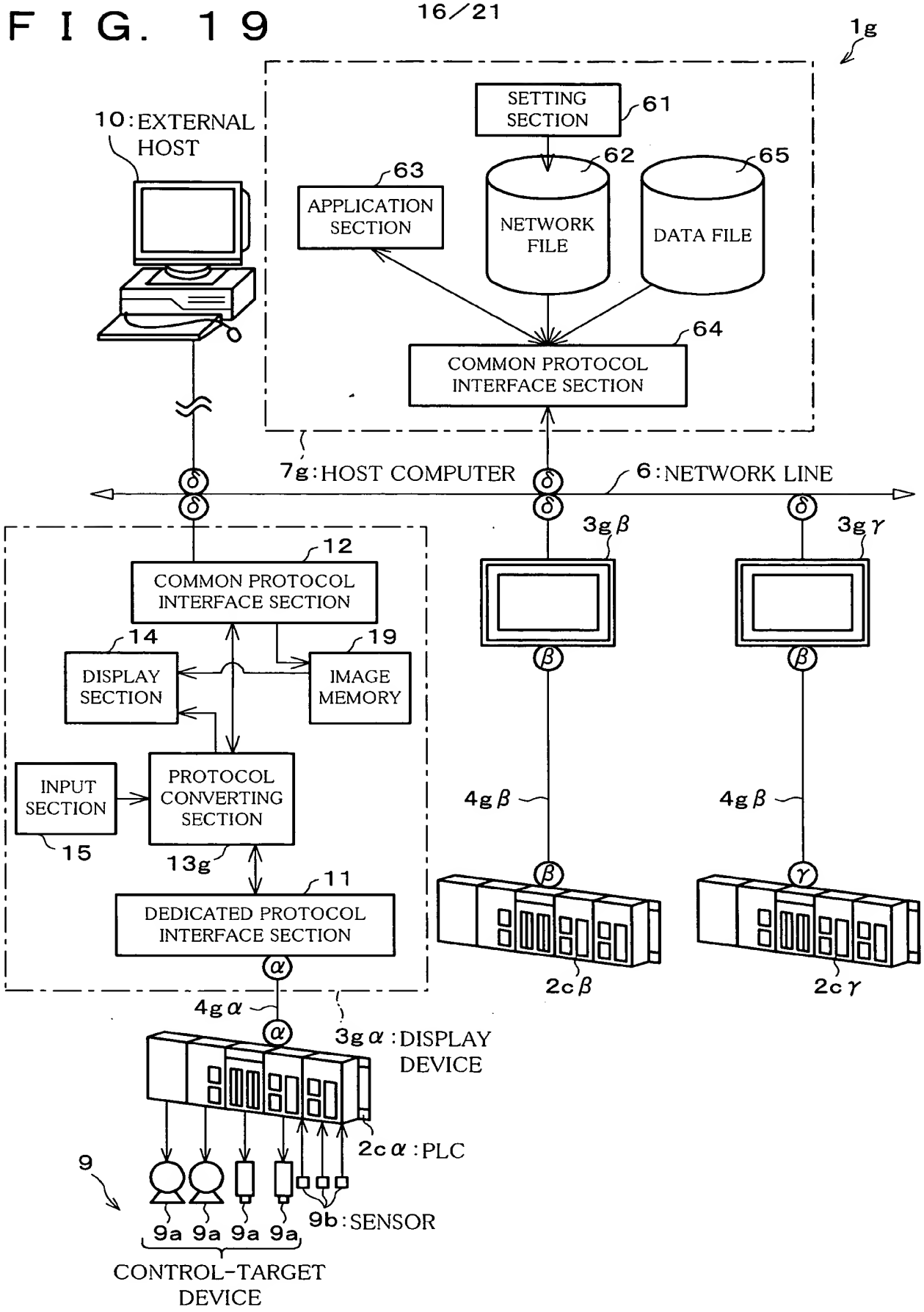
FIG. 19


1g
10:EXTERNAL HOST
SETTING SECTION
61
62
65
63
APPLICATION SECTION
NETWORK FILE
DATA FILE
64
COMMON PROTOCOL INTERFACE SECTION
7g:HOST COMPUTER
6:NETWORK LINE
δ
3gβ
3gγ
12
COMMON PROTOCOL INTERFACE SECTION
14
19
DISPLAY SECTION
IMAGE MEMORY
INPUT SECTION
15
PROTOCOL CONVERTING SECTION
13g
11
DEDICATED PROTOCOL INTERFACE SECTION
α
β
γ
4gβ
4gβ
2cβ
2cγ
4gα
3gα:DISPLAY DEVICE
2cα:PLC
9
9a 9a 9a 9a
9b:SENSOR
CONTROL-TARGET DEVICE

D0C20T 54749D0

FIG. 20

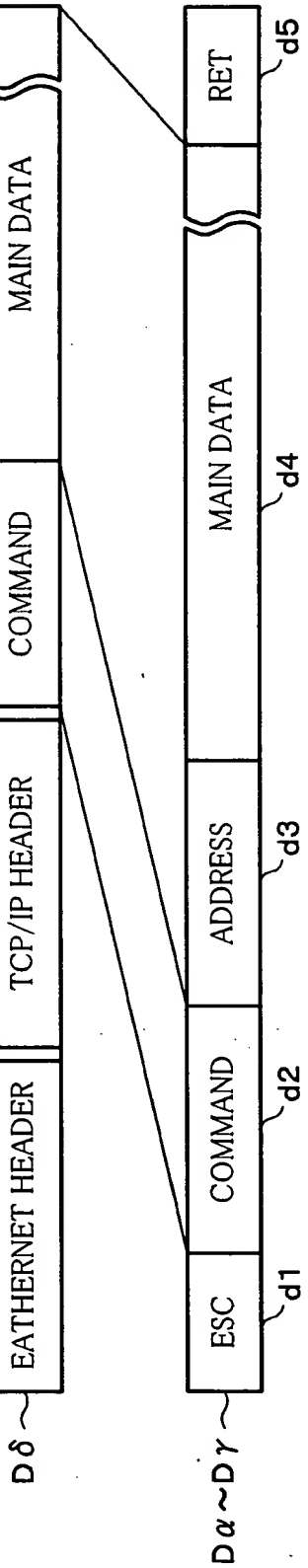


FIG. 21

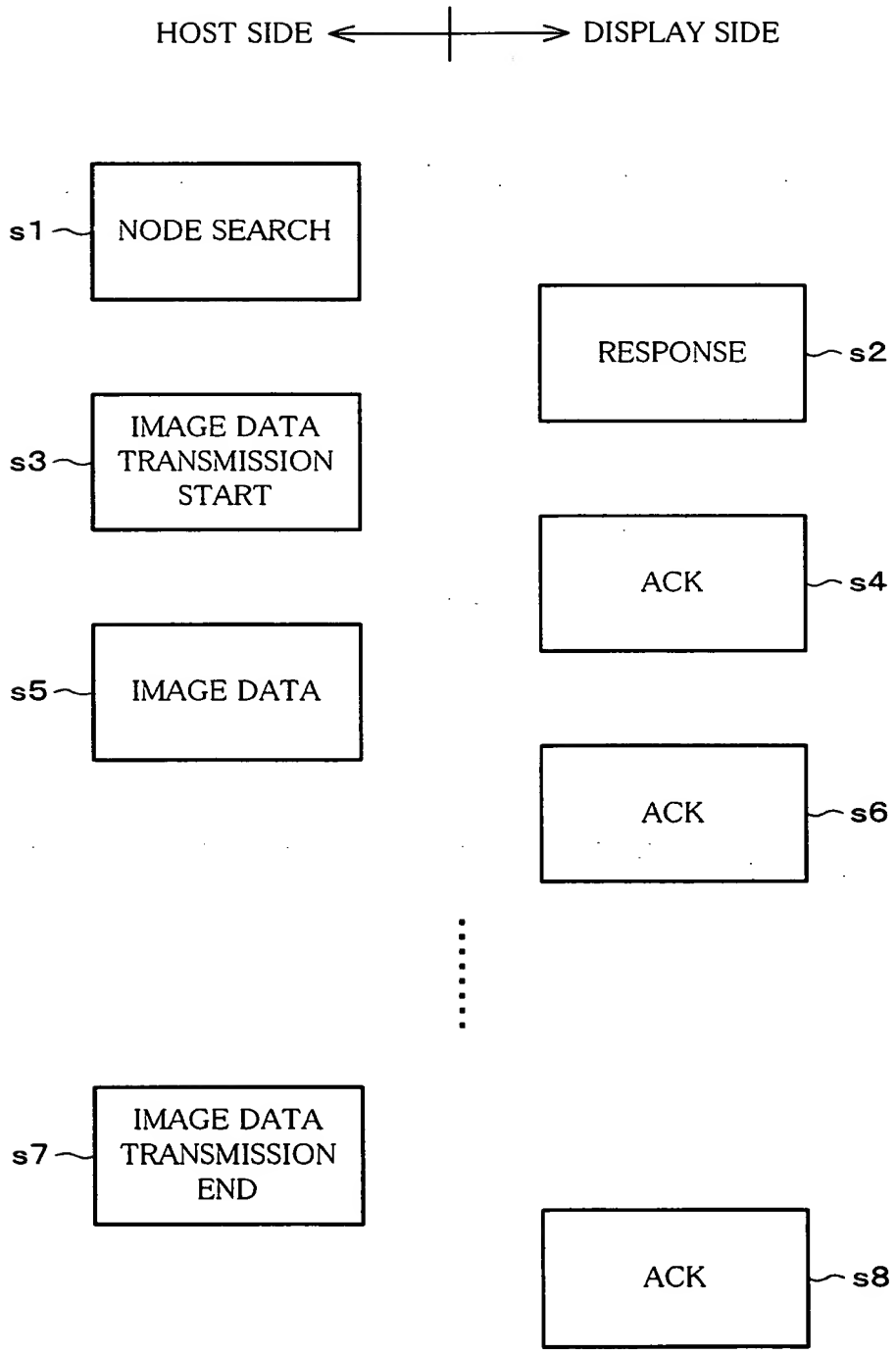


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FIG. 22

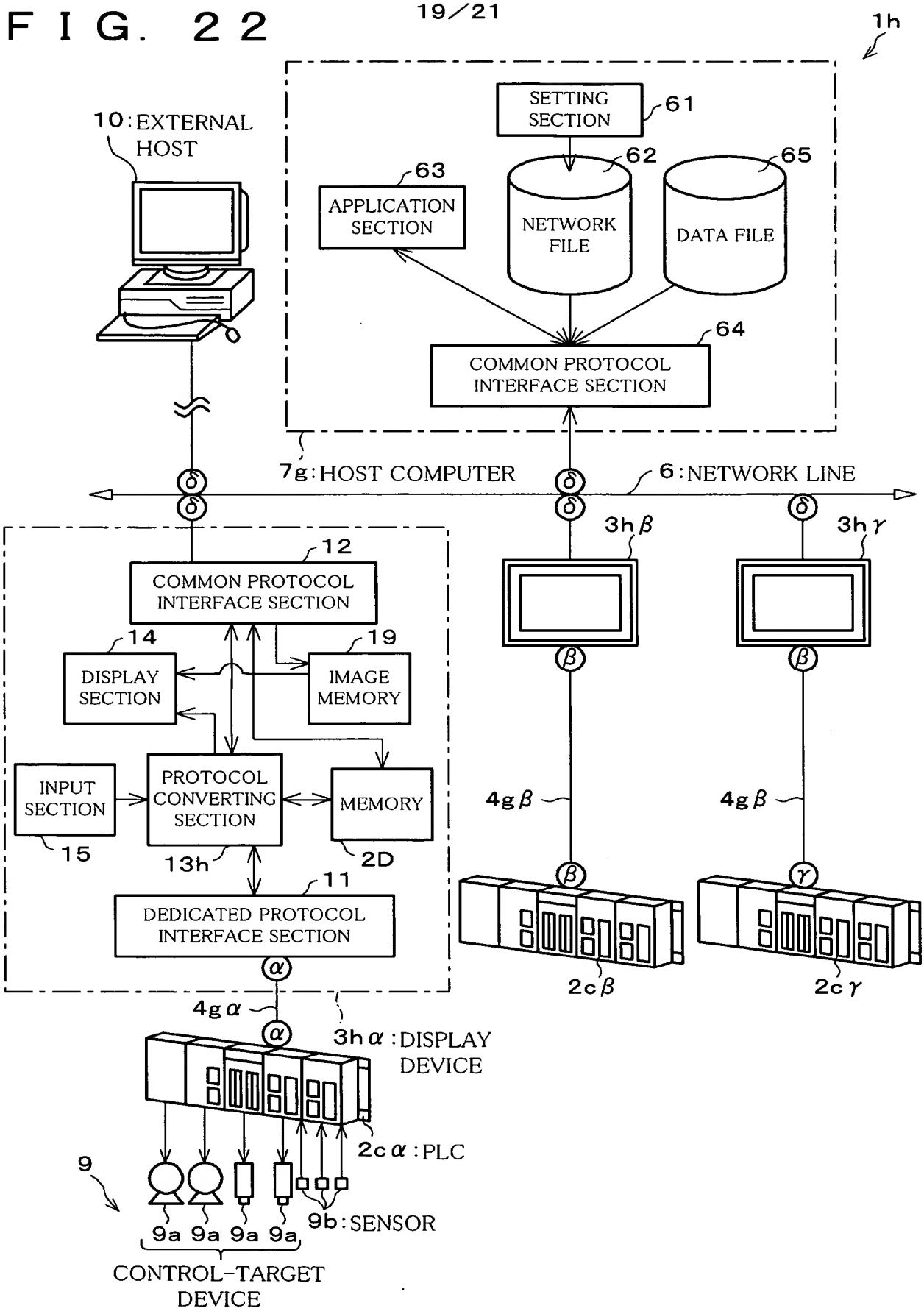
1h
10:EXTERNAL HOST
SETTING SECTION
61
62
65
63
APPLICATION SECTION
NETWORK FILE
DATA FILE
64
COMMON PROTOCOL INTERFACE SECTION
7g:HOST COMPUTER
6:NETWORK LINE
3hβ
3hγ
12
COMMON PROTOCOL INTERFACE SECTION
14
19
DISPLAY SECTION
IMAGE MEMORY
INPUT SECTION
PROTOCOL CONVERTING SECTION
MEMORY
15
13h
2D
11
DEDICATED PROTOCOL INTERFACE SECTION
4gβ
4gβ
2cβ
2cγ
4gα
3hα:DISPLAY DEVICE
2cα:PLC
9
9a 9a 9a 9a
9b:SENSOR
CONTROL-TARGET DEVICE

FIG. 23 (a)

FIG. 23 (b)

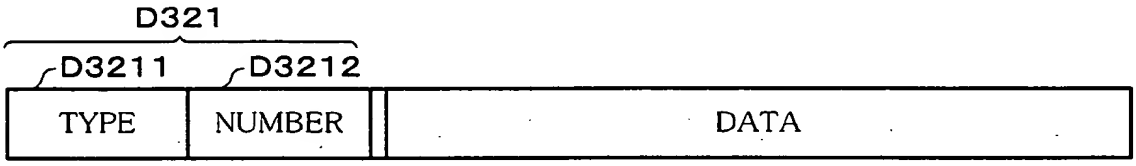

FIG. 23 (c)

FIG. 23 (d)

FIG. 23 (e)

FIG. 23 (f)

FIG. 23 (g)

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00'20'T 5'2T+'960
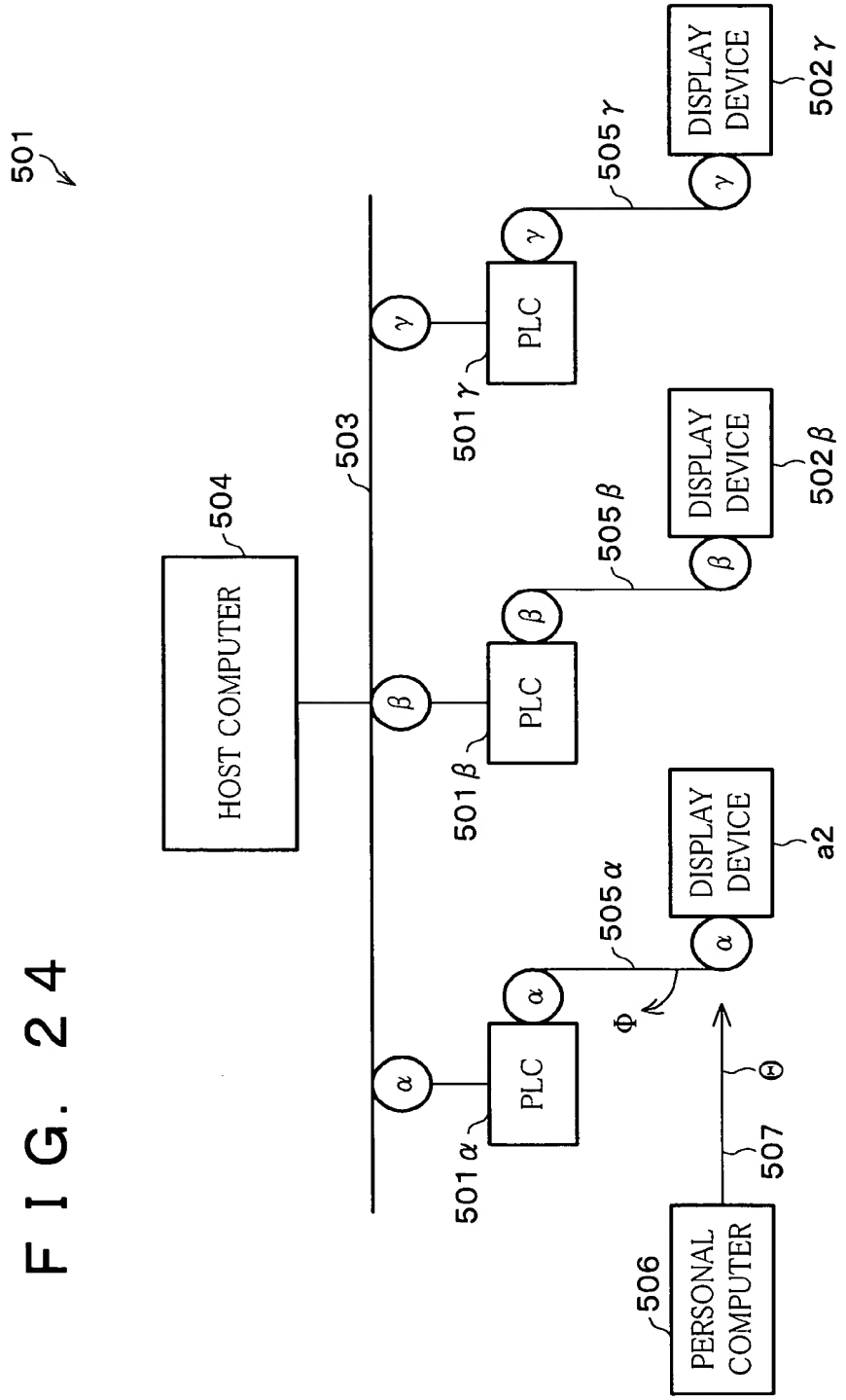
FIG. 24